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NAS WHITING FIELD
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MONTHLY PROGRESS REPORT FOR PHASE 2A REMEDIAL INVESTIGATIONS DURING
DECEMBER 1992 WITH TRANSMITTAL NAS WHITING FIELD FL
1/14/1993
ABB ENVIRONMENTAL



03.04.00.0010

1D-00190

January 14, 1992

Commanding Officer
ATTN: Kim Queen, Code 1859
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
Charleston SC 29411-0068

**SUBJECT: Monthly Progress Report
Remedial Investigation - Phase IIA
Naval Air Station Whiting Field
Milton, Florida
Contract N62467-89-D-0317**

Dear Kim:

Enclosed please find the monthly progress report for the Remedial Investigation (Phase IIA) work conducted at NAS Whiting Field during December 1992. An updated project schedule is also enclosed.

If you have any questions, please call me at 904-656-1293 (ext. 314). We look forward to working with you on the completion of this project.

Very truly yours,

ABB ENVIRONMENTAL SERVICES INC.

Rao V.R. Angara
Task Order Manager

cc: File: 7560-- (11.2.1)
Eric Blomberg, ABB-ES
Jim Holland, NASWF
Robert Pope, USEPA
John Bleiler, ABB-ES
Kathy St. Peter, ABB-ES
Tony Allen, ABB-ES

ABB Environmental Services, Inc.

MONTHLY PROGRESS REPORT
Naval Air Station Whiting Field
December 1992

A. TECHNICAL DESCRIPTION OF TASKS

I. Geophysical Survey: On 28 October 1992, ABB-ES received Contract Modification #2 to prepare a technical report describing the activities conducted and results obtained during this task. The draft geophysical survey technical report was submitted to SDIV on 14 December 1992. The report was submitted one month ahead of schedule.

Please see June 1992 monthly progress report for other details regarding this task.

II. Soil Gas Survey: On 28 October 1992, ABB-ES received Contract Modification #2 to prepare a technical report describing the activities conducted and results obtained during this task. The draft soil gas survey technical report will be submitted on/before 1 February 1993.

Please see June 1992 monthly progress report for other details regarding this task.

III. Surface Water and Sediment Sampling: Surface water and sediment sampling task has been completed on schedule. The validated data will be received from C.C. Johnson and Malhotra (validation subcontractor) during this reporting period. Due to the addition of the Soil Gas and Geophysical Survey reports the project schedule has been revised. Therefore, the revised deliverable date for submission of Technical Memorandum #1 (Surface Water and Sediment Assessment) is 17 February 1993.

IV. Soil Sampling: Surface soil sampling has been completed. Analytical data received from the laboratory has been submitted to the data validation subcontractor.

V. Test Pitting: Test pitting operations were conducted from September 30, 1992 through October 9, 1992. A total of 36 pits were excavated. Also 26 soil samples were collected for laboratory analysis. Preliminary data received from the laboratory does not indicate significant contamination. Analytical data received from the laboratory has been submitted to the data validation subcontractor.

VI. PCPT/BAT: PCPT/BAT sampling task was started on October 12, 1992. Based on approval from Mr. Bob Harvey (SDIV), Williams Earth Sciences from Clearwater, Florida was awarded the subcontract to complete this task. The PCPT/BAT task was completed on 4 November 1992.

The PCPT/BAT task involved cone soundings at seven locations and collection of 14 water samples at the

shallow and production zones. The QA/QC level for PCPT/BAT sample analysis is NEESA Level E. Analytical data (VOC analysis) has been received from the laboratory and is being evaluated by ABB-ES.

VII. Data Validation: Analytical data was submitted to C.C. Johnson and Malhotra for NEESA Level C and Level D validation.

VIII. Elevation and Location Survey: Northwest Florida Engineering is conducting the elevation and location survey at NAS Whiting Field. All sampling locations are being surveyed and included in the CAD file being created to accommodate the survey data. Future survey locations will be added to the CAD file as a separate layer. This will allow the production of separate drawings for each event and also provide a database for future work.

IX. Photography Support: Mr. Keith Peterson (ABB-ES) has provided photographic support in documenting all tasks completed since the beginning of the field program. All photographs are being labeled and placed in a photo album. The video documentation will be reviewed and a 30 minute tape will be prepared at the end of the Phase IIA program.

X. Soil Boring Program: The soil program was initiated on November 30, 1992. The purpose of the soil boring program conducted during this shift was to evaluate the nature and extent of soil contamination and provide lithologic data for Sites 6, 30, and 33. A total of 10 soil borings were drilled at these sites. The soil program is complete for Sites 6 and 33 while Site 30 has six remaining borings. A summary of the soil borings completed during this reporting period is presented in Table 1 of Attachment A.

During this reporting period, 46 subsurface soil samples were collected from the ten borings for laboratory analysis. The samples were analyzed for TCL VOCs, TCL SVOCs, pesticides/PCBs, TAL metals, cyanide, TPH, TOC, and TCLP metals. A summary of the soil samples that were collected for analysis is presented in Table 2 of Attachment A.

XI. Ecological and Public Health Survey: A field consisting of two senior ecologists and a public health specialist completed the ecological and public health survey during this reporting period. A summary of ecological field activities is included in Attachment B.

B. STATUS OF WORK TO DATE

- Geophysical survey field program has been completed. A final report was submitted by BGI on 31 August 1992. Based on Contract Modification #2, a technical report presenting the results and findings of this survey was

submitted to SDIV on 14 December 1992.

- The field program for soil gas survey has also been completed. NERI submitted the final report to ABB-ES in September 1992. Based on the Contract Modification, a technical report is being prepared to present the results and findings of this survey.
- The surface water and sediment sampling task has been completed. A technical memorandum is being prepared to present the assessment of surface water and sediment contamination at NAS Whiting Field.
- The final record search document was submitted to SDIV in September 1992.
- ABB-ES and SDIV met with the U.S. Environmental Protection Agency (USEPA), National Oceanic and Atmospheric Administration (NOAA), and Florida Department of Environmental Regulation (FDER) on 13 November 1993 to discuss Navy response to agency comments for the Phase I Final Technical Memoranda. Several items involving project scope change were recommended by the agencies. These will be presented in a scope change memoranda and submitted to SDIV.
- Test pitting operations, as proposed in RI Phase I Technical Memorandum 6, have been completed.
- PCPT/BAT activities were started on October 12, 1992 and completed on November 4, 1992. Seven PCPT soundings and 14 BAT samples were collected as planned.
- Data packages (surface soil, subsurface soil, surface water, and sediment sampling) were submitted to C.C. Johnson and Malhotra for validation.
- Elevation and location survey of geophysical survey, soil gas survey, soil sampling locations has been completed. A draft report was received from the subcontractor. The subcontractor has also completed the survey of the test pitting and PCPT/BAT locations.
- The soil program was initiated on November 30, 1992. A total of 10 soil

borings were drilled during December 1992.

C. PROBLEMS ENCOUNTERED DURING REPORTING PERIOD

- ABB-ES was informed by the data validation subcontractor that some data packages submitted by the laboratory have missing data. This issue is being discussed with the laboratory manager and the missing data are being added to the data packages.

There is a discrepancy between the NEESA Level C deliverable list and the NEESA Level C data validation guidelines. The laboratory has informed that they will provide the subcontractor the missing information for the metals data packages. Based on this submission, the data validation for the surface water sediment data should be completed during the next reporting period. Attachment C is a memorandum summarizing discussions between ABB-ES and CH2MHILL regarding the NEESA Level C deliverable requirements.

- During the ecological survey, the ABB-ES ecologists detected extensive sediment contamination along an unnamed stream that is a tributary to Clear Creek. The stream was formed from the installation of a concrete drainage ditch that drains the southwestern portion of Whiting Field. To obtain more information concerning the contamination, a site reconnaissance was conducted on December 6, 1992. Sediments from about halfway between the concrete drainage ditch outfall to Clear Creek produced a petroleum sheen and odor when agitated. The contamination was only found in sediments that were rich in organic matter.

Based on discussions with the EIC, one sample was collected from the contaminated area for NEESA Level E analysis for full scan TCL/TAL analysis. The raw data is attached to this report (Attachment D).

D. ACTIVITIES PLANNED FOR NEXT MONTH

- Continue soil boring program.
- TFMR and Monthly Progress Report.

- Preparation of Draft Technical Memorandum #1, Draft Soil Gas Survey Technical Report, and Draft Final Geophysical Survey Technical Report.
- Initiate the monitoring well installation program.

E. SCHEDULED DELIVERABLES FOR JANUARY 1993

- TFMR
- Monthly Progress Report
- Draft Geophysical Survey Technical Report (submitted 12/14/92)

F. CORRESPONDENCE AND DOCUMENTS RECEIVED

- Acknowledgement of receipt of soil samples from CH2MHILL.
- Data packages for soil, surface water, and sediment events.
- Data validation package for sampling event 1 of the surface water and sediment sampling was received during this reporting period.
- CCJM data validation reports.

G. COST IMPACTS

- As discussed in the previous reports, the change in the test pitting subcontractors has resulted in an increase in the subcontractor costs. Also the field work was conducted in Level B and Level C protection at several of the test pitting locations.
- The analytical cost for analysis of the sample from the Clear Creek area was not included in the scope of CTO-050. A change notification memorandum has been submitted to the ABB-ES contracts manager.

H. SAMPLING AND ANALYSIS RESULTS

- Analytical data for test pitting and PCPT/BAT programs were received during this reporting period.
- Analytical data for sediment sample from the Clear Creek area was

received during this reporting period.

I. LABORATORY MONTHLY PROGRESS REPORTS

- None

J. PLANNED CHANGES IN PERSONNEL AND THEIR QUALIFICATIONS

- The project team comprises of the following personnel.

Rao Angara, Task Order Manager
Eric Blomberg, Technical Leader
Salvatore Consalvi, Field Operations Leader
Kathy Hodak, Project Assistant
Gerald Walker, Senior Scientist
Gopi Kanchibhatla, Associate Engineer
Patrick Craine, Senior Technician
John Bleiler, Senior Scientist (Ecologist)
Keith Peterson, Graphics and Photography
David Daniel, Public Health Specialist
Norman Richardson, Senior Ecologist
Drew Lonergan, Hydrologist

K. PERCENT COMPLETION

Task	Title	% Complete
1	Project Management	23
2	Field Preparation	26
3	Geophysical Survey	80 (Field Program Completed)
4	Soil Gas Survey	80 (Field Program Completed)
5	Surface water and Sediment Sampling	90 (Sampling Completed)
6	Test Pitting	99
7	Soil Sampling	75 (Surface Soil Sampling Completed)
8	PCPT/BAT	99
9	Soil Boring and Monitoring Well Installation	15
10	Groundwater Sampling	0
11	Water Level Measurement	0
12	Elevation and Location Survey	35
13	Ecological Survey	50
14	Data Validation	8
15	Photography Support	30
16	Technical Memoranda Preparation	5
17	Contamination Assessment Report	0
18	Groundwater Modelling	0

Note: Photography support effort includes videotaping and photographing geophysical survey, soil gas survey, and surface water and sediment sampling events.

L. TARGET/ACTUAL COMPLETION DATES (by task)

Task	Title	Scheduled	Actual
1	Project Management	3-30-92 to 4-30-94	3-30-92 to 6-26-95
2	Field Preparation	4-23-92 to 4-30-94	4-23-92 to 4-30-94
3	Geophysical Survey	5-28-92 to 8-14-92	5-28-92 to 8-14-92
4	Soil Gas Survey	6-26-92 to 8-31-92	6-26-92 to 8-31-92
5	Surface Water and Sediment Sampling	7-6-92 to 8-1-92	7-6-92 to 8-1-92
6	Test Pitting	9-14-92 to 10-9-92	9-14-92 to 10-9-92
7	Soil Sampling	8-3-92 to 11-10-92	8-3-92 to 11-10-92
8	PCPT/BAT	11-5-92 to 12-28-92	10-12-92 to 11-4-92
9	Soil Boring & Well Installation	1-4-93 to 2-4-94	12-1-92 to 2-4-94
10	Groundwater Sampling	2-7-94 to 6-30-94	2-7-94 to 6-30-94
11	Water Level Measurement	5-2-94 to 5-13-94	5-2-94 to 5-13-94
12	Locational Survey	2-7-94 to 3-30-94	2-7-94 to 3-30-94
13	Ecological Survey	2-5-94 to 3-13-94	12-1-92 to 2-26-92
14	Data Validation	6-15-94 to 10-16-94	8-1-92 to 10-16-94
15	Photography Support	5-4-92 to 6-30-94	5-4-92 to 6-30-94
16	Technical Memoranda Preparation	9-1-94 to 4-4-95	12-1-92 to 4-4-95
17	CA Reports	11-16-94 to 11-29-94	11-16-94 to 11-29-94
18	Groundwater Modelling	-----	-----

- Notes:
1. Task 1 includes project management tasks. Therefore it is for the duration of the project.
 2. Task 2 includes the FOL effort for the complete project.
 3. Shaded area indicates modifications to schedule.
 4. The soil boring program was initiated ahead of schedule because the PCPT/BAT operations were completed ahead of schedule.
 5. The PCPT/BAT operations were completed ahead of schedule because the cone soundings could not be conducted to the proposed depths. Also the drill rig and the cone truck were operated simultaneously.
 6. Based on the revised schedule, the Technical Memorandum #1 preparation was started during this reporting period.

ATTACHMENT A

Table - 1
Soil Boring Summary - Shift 1
NAS Whiting Field

<u>Site</u>	<u>Date Completed</u>	<u>Boring Number</u>	<u>Total Depth (ft)</u>
33	12-1-92	WHF-33-SB-3	22
33	12-2-92	WHF-33-SB-4	24
33	12-3-92	WHF-33-SB-1	27
33	12-3-92	WHF-33-SB-2	122
6	12-4-92	WHF-6-SB-1	22
6	12-4-92	WHF-6-SB-2	22
6	12-4-92	WHF-6-SB-4	22
6	12-5-92	WHF-6-SB-3	119
33	12-6-92	WHF-33-SB-5	22
30	12-8-92	WHF-30-SB-1	122

Table - 2
Soil Sample Collection Summary - Shift 1
NAS Whiting Field

<u>Site</u>	<u>Date</u>	<u>Sample Number/Depth</u>
33	12-1-92	WHF-33-SB-2 (2-4)
		WHF-33-SB-2 (5-7)
		WHF-33-SB-2 (10-12)
		WHF-33-SB-2 (15-17)
		WHF-33-SB-3 (4-6)
		WHF-33-SB-3 (10-12)
		WHF-33-SB-3 (15-17)
	12-2-92	WHF-33-SB-4 (3-5)
		WHF-33-SB-4 (5-7)
		WHF-33-SB-4 (15-17)
	12-3-92	WHF-33-SB-1 (3-5)
		WHF-33-SB-1 (10-12)
		WHF-33-SB-1 (25-27)
		WHF-33-SB-2 (35-37)
		WHF-33-SB-2 (60-62)
		WHF-33-SB-2 (80-82)
		WHF-33-SB-2 (95-97)
		WHF-33-SB-2 (120-122)
6	12-4-92	WHF-6-SB-1 (5-7)
		WHF-6-SB-1 (15-17)
		WHF-6-SB-1 (20-22)
		WHF-6-SB-2 (0-2)
		WHF-6-SB-2 (15-17)
		WHF-6-SB-2 (20-22)
		WHF-6-SB-4 (0-2)
		WHF-6-SB-4 (5-7)
		WHF-6-SB-4 (10-12)
	12-5-92	WHF-6-SB-3 (0-2)
		WHF-6-SB-3 (5-7)
		WHF-6-SB-3 (10-12)
		WHF-6-SB-3 (15-17)
		WHF-6-SB-3 (25-27)
		WHF-6-SB-3 (60-62)
		WHF-6-SB-3 (117-119)

Table - 2 (cont)
Soil Sample Collection Summary - Shift 1
NAS Whiting Field

<u>Site</u>	<u>Date</u>	<u>Sample Number/Depth</u>
33	12-6-92	WHF-33-SB-5 (0-2) WHF-33-SB-5 (5-7) WHF-33-SB-5 (10-12) WHF-33-SB-5 (20-22)
30	12-6-92	WHF-30-SB-1 (2-4) WHF-30-SB-1 (5-7) WHF-30-SB-1 (10-12) WHF-30-SB-1 (15-17)
	12-7-92	WHF-30-SB-1 (35-37) WHF-30-SB-1 (60-62)
	12-8-92	WHF-30-SB-1 (120-122)

ATTACHMENT B



Inter-Office Correspondence

PROJECT: Naval Air Station Whiting Field, Milton, Florida
PROJECT #: 07560.33 (NAVYCLEAN)
TO: Distribution
FROM: John A. Bleiler, Senior Environmental Scientist
DATE: December 29, 1992
SUBJECT: Trip Report
Ecological Field Activities
November 30 through December 4, 1992

This memorandum serves as a trip summary report for ecological field activities conducted between November 30 and December 4, 1992, at Naval Air Station Whiting Field (NAS Whiting Field), in Milton, Florida. During this time period, two ecologists (myself and Norman Richardson) from the ABB-ES Wakefield, Massachusetts, office conducted ecological field activities at NAS Whiting Field.

The primary objectives of this phase of the ecological field program were to:

- Qualitatively characterize the ecological communities associated with Clear Creek, a perennial stream located to the south and west of NAS Whiting Field
- Identify ecological receptors (i.e., flora and fauna) in the vicinity of Clear Creek which could potentially be exposed to environmental media (i.e., surface water and sediment) contaminated with site-related contaminants
- Identify possible site-specific exposure pathways through which ecological receptors could be exposed to contaminated media at and in the vicinity of Clear Creek
- Qualitatively observe possible signs and symptoms of stress on biological receptors at and in the vicinity of Clear Creek
- Conduct a preliminary inspection of all NAS Whiting Field sites identified in the Remedial Investigation and Feasibility Study (RI/FS) Technical Memorandum No. 6 (ABB-ES, 1992)
- Gather sufficient information to prepare a site-specific work plan detailing any proposed ecological activities at NAS Whiting Field

The results of the ecological field program will be incorporated into the Baseline Ecological Risk Assessment (BERA) for NAS Whiting Field. The purpose of the NAS Whiting Field BERA will be to define baseline biological effects associated with exposure to chemical constituents in environmental media at the installation, and in off-base areas that may have been contaminated as a result of site-related activities.

Additional detail regarding ongoing and proposed ecological activities will be presented in the forthcoming ecological work plan for NAS Whiting Field.

GUIDANCE

All ecological field work conducted at NAS Whiting Field has been performed in accordance with the written guidance of the United States Environmental Protection Agency (USEPA), including "Risk Assessment Guidance for Superfund: Environmental Evaluation Manual" (USEPA, 1989); "Ecological Assessment at Superfund Sites: An Overview" (USEPA, 1991); and, Ecological Assessments of Hazardous Waste Sites: A Field and Laboratory Reference Document: (USEPA, 1989b). When applicable, the written guidance of the State of Florida has also been adhered to at this facility (i.e., Florida Department of Environmental Regulation [FDER], 1992).

Although no formal work plan exists specifically for ecological activities at NAS Whiting Field, guidance followed by ABB-ES ecologists during this phase of the ecological field program includes the following site-specific documents:

June, 1990, ABB-ES Final RI/FS Planning Document, Volume 1 of 3, pages 158-164, section 5.3.5.1, "Phase II - Potential Receptor Survey".

This portion of the RI/FS Planning Document summarizes a proposed biological survey to be conducted at NAS Whiting Field. Specific recommendations for certain ecological activities are contained within this section of the RI/FS Planning Document. Ecological activities proposed in this Planning Document are presented in a general sense, and were proposed prior to production of the six ABB-ES Technical Memoranda for NAS Whiting Field.

May, 1992, ABB-ES RI/FS Technical Memorandum No. 6, Phase I Data Summary and Phase II-A Work Plan, page 7-5, section 7.0, "Ecological Survey"

This section presents a summary of the ecological survey to be conducted at NAS Whiting Field. The ecological survey outlined in Technical Memorandum No. 6 includes a qualitative inventory of flora and fauna, literature review, and wetlands identification and functional assessment. With the exception of the wetlands functional assessment, all elements of the wetlands the ecological survey outlined in this document are summarized below. Because the wetlands functional assessment typically is employed in the RI/FS process to provide information related to mitigation and habitat restoration, it may not be necessary to conduct this activity until the FS process is underway.

SUMMARY OF ACTIVITIES

Ecological data were recorded in a bound field log book, on photocopied data forms, and using a handheld tape recorder. All tape recorded notes have been transcribed to the bound field book. Thirty-five millimeter slide and print photographs were taken throughout this phase of the ecological field program.

The following ecological activities were conducted during the November 30 to December 4, 1992 time period:

1. Conduct inspections of the Clear Creek surface water and sediment sampling stations

ABB-ES ecologists attempted to conduct site inspections of the 11 surface water and sediment sampling stations depicted in Figure 7-2 of Technical Memorandum No. 6 (ABB-ES, 1992). The following stations were located (i.e., the wooden stakes designating the sampling points were located): stations 1, 2, 3, 4, 5, 6, 7, 8, and 9. Despite several attempts, the precise locations of sampling stations 10 and 11 were not found (i.e., no wooden stakes designating the sampling points were located); however, based on the presence of surveyor's flagging, the general locations of these two stations were defined to within 20 to 30 feet.

2. Characterization of major ecological communities associated with Clear Creek

An extensive floodplain forest borders Clear Creek; dense shrub growth, standing water, and sandy organic soils overlain by peat characterize the habitat in this region. As a result, gaining access to all portions of the floodplain was difficult. Major vegetative community types within and adjacent to the Clear Creek floodplain were identified during this phase of the ecological investigation.

In general, transitional upland/wetland habitats are found downgradient of ruderal (i.e., disturbed) habitats and upland slash pine (*Pinus elliotii*) forests of NAS Whiting Field. The dominant flora within the Clear Creek transitional zone includes slash pine, longleaf pine (*Pinus palustris*), water oak (*Quercus nigra*), sweet bay magnolia (*Magnolia virginiana*), largeleaf magnolia (*Magnolia grandiflora*), and various holly species (*Ilex* spp.).

Downgradient of the transitional region, hydrophytic habitats in the vicinity of Clear Creek include titi swamps, bay swamps, and bottomland forest hardwoods (habitat types of Wolfe et al., 1991). In general, titi and bay swamps occur in the upper regions of the Clear Creek floodplain, and bottomland hardwood swamp occurs in the lower floodplain, bordering Clear Creek.

Titi swamps in the vicinity of Clear Creek are dominated by black titi (*Cliftonia monophylla*) and swamp titi (*Cyrilla racemiflora*). Swamp titi tends to dominate much of the shrub community in the upper regions of the floodplain, and black titi occurs sparsely at the site. Other species observed in the site's titi and bay swamps include red maple (*Acer rubrum*), slash pine, sweetbay magnolia, fetterbush (*Lyonia lucida*), several holly species, royal fern (*Osmunda cinnamomea*), and chain fern (*Woodwardia areolata*). In the vicinity of several of the sampling stations, Atlantic white cedar (*Chamaecyparis thyoides*) is a conspicuous and dominant member of the hydropytic forest community.

Between Clear Creek and the upper swamp communities, a bottomland hardwood forest occurs. This habitat is dominated by black gum (*Nyssa sylvatica*), also known as swamp tupelo. Other species observed in the site's bottomland hardwood swamp include red maple, fetterbush, several holly species, royal fern, chain fern, rush (*Juncus* sp.), and sphagnum moss (*Sphagnum* spp.).

3. Characterization of animal species inhabiting major community types

Literature sources reviewed prior to and during the November 30 to December 4, 1992 ecological field program indicate that Clear Creek and its associated floodplain wetlands are expected to provide suitable habitat for a diverse assemblage of wildlife species. A rich diversity of invertebrates inhabit the floor and arboreal canopy of floodplain forests in the Florida panhandle (Wolfe et al., 1991). These invertebrates are consumed by a number of amphibian, reptile, bird and mammal species, which in turn provide food for many secondary and tertiary consumers.

Observations of animals encountered (including tracks, scat, and other "sign") by ABB-ES ecologists were recorded in the bound field book. Non-breeding birds observed in the floodplain during this phase of the field program included the American crow (*Corvus brachyrhynchos*), Carolina chickadee (*Parus carolinensis*), rufous-sided towhee (*Pipilo erythrophthalmus*), yellow-rump warbler (*Dendroica coronata*), palm warbler (*D. palmarum*), cardinal (*Cardinalis cardinalis*), solitary vireo (*Vireo solitarius*), American robin (*Turdus migratorius*), ruby crowned kinglet (*Regulus calendula*), and the pileated woodpecker (*Dryocopus pileatus*). In addition, the floodplain region likely provides habitat for a different assemblage of breeding birds during the summer months. Several American kestrels (*Falco sparverius*), a sharp-shinned hawk (*Accipiter striatus*), a loggerhead shrike (*Lanius ludovicianus*), and a turkey vulture (*Cathartes aura*) were observed perched or foraging in upland habitats in the vicinity of the floodplain. Signs of white-tailed deer (*Odocoileus virginianus*) and raccoon (*Procyon lotor*) were encountered in the floodplain swamp, which probably provides habitat for a number of insectivorous, herbivorous, and carnivorous mammals.

The sole reptile observed in the floodplain was the water moccasin (*Agkistrodon piscivorous*) and the sole amphibian encountered was a Plethodontid salamander (to date not identified to species); however, the site's wetlands are expected to provide suitable

habitat for a diverse assemblage of reptiles and amphibians, which may be more apparent in the warmer months. Small fish observed at Clear Creek (and in its floodplain) include: a chub (possible *Nocomis* sp.); speckled madtom (*Noturus leptacanthus*); pygmy sunfish (*Elassoma zonatum*); black crappie (*Pomoxis nigromaculatus*); pirate perch (*Aphredoderus sayanus*); and, mosquitofish (*Gambusia affinis*).

The BERA for NAS Whiting Field will provide additional detail regarding animal species that may occur at the site.

4. Characterization of aquatic and wetland habitats

A preliminary, qualitative investigation of the benthic macroinvertebrate community in Clear Creek and its associated floodplain was conducted in the vicinity of several surface water/sediment sampling locations (stations numbers 2, 4, 5, 8, 9, 10, and 11). This preliminary investigation employed an integrated approach, incorporating habitat (e.g., physical structure, flow regime, etc.) and biological measures. The purpose of this activity was to serve as a screening tool to:

- determine if quantitative assessment(s) of the benthic macroinvertebrate community at Clear Creek is warranted (and feasible); and,
- assess whether or not any gross differences among sampling stations exist.

Benthic invertebrate studies can provide a practical means to determine if an aquatic system is supporting or is not supporting a benthic macroinvertebrate community; these studies can also be employed to characterize the existence and extent of an impairment, identify source and causes of impairments, evaluate the effectiveness of remedial actions, and characterize regional biotic components (Plafkin *et al.*, 1989; FDER, 1992).

Information regarding the physical attributes of the aquatic habitat at the sampling stations (including nature of the substrate and vegetative characteristics) was collected at each sampling station. These observations were recorded on field data sheets similar to those designed by Plafkin *et al.* (1989). Sampling of macroinvertebrates was accomplished through use of D-frame aquatic dip nets (#30 mesh or ~575 microns). Sweeps were taken in as many different habitat types as possible at a particular sampling location (e.g. under overhanging vegetation and logs, and along banks). Collected material was placed in an approximately 600 micron mesh wash bucket and rinsed prior to picking. All organisms from the wash bucket were collected and identified to taxonomic order. Voucher collections of all macroinvertebrate taxa collected were placed in sample jars and preserved in approximately 70 percent alcohol.

Because of the qualitative nature of the benthic macroinvertebrate sampling program, quantitative analysis of the benthic macroinvertebrate data has not been conducted.

However, the following general observations were made:

- Clear Creek and its floodplain appear to provide habitat for an assemblage of benthic macroinvertebrates, including members of the following taxa: Turbellaria; Oligochaeta; Decapoda; Bivalvia; Anisoptera; Zygoptera; Coleoptera; Chironomidae; Tipulidae; and, Plecoptera
- Sufficient numbers and diversity of benthic macroinvertebrates exist at the site for quantitative bioassessment work
- Sampling stations 4 and 5 may contain less taxa diversity than other sampling stations evaluated.

Any future quantitative sampling of benthic macroinvertebrates should be conducted in warmer months of the year (rather than in winter), and reference stations will need to be located for these studies.

5. Documentation of stressors in the vicinity of Clear Creek

Concrete drainage swales at NAS Whiting Field convey surface water from developed upland areas to the Clear Creek floodplain. In the vicinity of floodplain sampling station numbers 4 and 5, a man-made drainage ditch carries surface water from the concrete swale discharge, through the floodplain, and into Clear Creek. This ditch is bordered by extensive hydrophytic floodplain habitats.

While conducting ecological field work in the region of this man-made floodplain drainage ditch, petroleum hydrocarbon contamination of floodplain sediments was observed. Floodplain sediments in this region are saturated with an oily, odorous substance. Considerable petroleum hydrocarbon sheen was noted in areas where the sediments were manually disturbed. The horizontal and vertical extent of contamination in this region was not determined; however, this petroleum hydrocarbon contamination appears to be associated with peaty organic sediments, rather than with sandy material.

Insufficient data were gathered to determine whether or not contamination in this region of the floodplain is having an adverse impact on ecological receptors. As detailed above, preliminary evidence suggests that the benthic macroinvertebrate community in the vicinity of surface water/sediment sampling stations 4 and 5 may be taxonomically depauperate relative to other sampling stations evaluated.

6. Conduct preliminary site inspections of all sites at NAS Whiting Field

On December 2, 1992, the NAS Whiting Technical Lead (Eric Blomberg) accompanied ABB-ES ecologists on a tour of the potential disposal sites currently under investigation

in the RI/FS process at NAS Whiting Field. A list of the sites inspected is presented in the RI/FS Technical Memorandum No. 6 (ABB-ES, 1992).

The potential disposal sites observed by ABB-ES ecologists include a number of sites located in developed, industrialized regions of NAS Whiting Field. These regions are paved, covered with buildings or other structures, or otherwise managed and/or disturbed to the point where they provide little to no ecological habitat. A preliminary list of developed sites with little to no habitat includes: Site 3 (Underground Waste Solvent Storage Area); Site 4 (North AVGAS Tank Sludge Disposal Area); Site 5 (Battery Acid Seepage Pit); Site 6 (South Transformer Disposal Area); Site 7 (South AVGAS Tank Sludge Disposal Area); Site 8 (AVGAS Fuel Spill Area); Site 29 (Auto Hobby Shop); Site 30 (South Field Maintenance Hangar); and, Site 33 (Mid-Field Maintenance Hangar). A detailed ecological characterization of these sites may not be necessary, since no ecological receptors or exposure pathways are likely to be associated with these developed areas.

The remaining potential disposal areas at NAS Whiting Field include sites located in ruderal, open field, and secondary growth slash pine habitats. Additional ecological characterization of these sites may be necessary.

7. Identification of aquatic reference areas

In order to conduct any future quantitative bioassessment studies at NAS Whiting Field, non-impacted reference stations may be required. Because of the qualitative nature of this preliminary assessment, no aquatic reference stations were identified at NAS Whiting Field. The preliminary investigation indicates that suitable reference stations for the Clear Creek floodplain habitat may be found either: (a) on the installation (e.g., in those surface water/sediment sampling stations that have been sampled and have no detected contamination); (b) or off-base (e.g., upstream on Clear Creek).

8. Identification of sensitive/significant ecological resources

Numerous specimens of the white-topped pitcher plant (*Sarracenia leucophylla*) were observed in the vicinity of two Clear Creek surface water/sediment sampling stations (stations 2 and 11). This carnivorous plant is a state-endangered species in Florida, and is a candidate for listing under the federal Endangered Species Act (Florida Game and Freshwater Fish Commission [FGFWFC], 1991). The white-topped pitcher plant has been previously observed elsewhere at NAS Whiting Field, within the Clear Creek floodplain (Environmental Protection Systems, Inc. [EPS], 1991).

Two other state-threatened plant species known to occur at NAS Whiting Field --the water sundew (*Drosera intermedia*) and the Florida-anise tree (*Illicium floridanum*)-- were not observed during this phase of the ecological field program. These two plants are known to occur in and adjacent to the Clear Creek floodplain (EPS, 1991).

(FGFWFC, 1991); it is not known whether the observed wintering kestrels at NAS Whiting Field are members of the southeastern subspecies. Information has been requested from state and federal authorities regarding the presence of any protected species or habitats at NAS Whiting Field.

9. Meet with Base Personnel to Discuss Ecological Field Activities

On December 2, 1992, a meeting was held with base personnel to discuss on-going and future ecological activities related to the RI/FS process at NAS Whiting Field. Goals and objectives for the forthcoming ecological work plan were discussed, as was the role of natural resources trustees in the RI/FS process.

TRIP REPORT SUMMARY

In summary, considerable ecological data were gathered during the week of November 30 through December 4, 1992. These data will be incorporated into the forthcoming: Ecological Assessment Work Plan, and the Baseline Ecological Risk Assessment.

Additional ecological investigation of NAS Whiting Field is recommended in order to:

- Further characterize upland, wetland, and aquatic communities and ecological receptors which may be exposed to environmental contamination.
- Determine whether or not the petroleum hydrocarbon contaminated floodplain in the vicinity of surface water/sediment sampling stations 4 and 5 is adversely impacting ecological receptors.
- Gather necessary data for the BERA.

Please don't hesitate to contact me if any questions arise. Happy Holidays!

DISTRIBUTION:

Rao Angara, Project Manager (ABB-ES Tallahassee)
✓ Eric Blomberg, Technical Lead (ABB-ES Tallahassee)
Tracy Stenner, Navy Clean Team Leader (ABB-ES Wakefield)
Michael Murphy, Department Manager (ABB-ES Wakefield)

References Cited

- ABB-ES, 1990. Remedial Investigation and Feasibility Study Planning Document, Work Plan, Naval Air Station Whiting Field, Milton, Florida, June, 1990.
- ABB-ES, 1992. Remedial Investigation and Feasibility Study, Technical Memorandum No. 6, Naval Air Station Whiting Field, Milton, Florida, May, 1992.
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- Florida Department of Environmental Regulation (FDER), 1992. "Draft Standard Operating Procedures Manual: Benthic Macroinvertebrate Sampling and Habitat Assessment Methods: 1. Freshwater Streams and Rivers"; FDER Contract No. 385; Prepared by: EA Engineering, Science, and Technology, Inc.; Carrollton, Texas, August 1992.
- Florida Game and Freshwater Fish Commission (FGFWFC), 1991. "Official Lists of Endangered and Potentially Endangered Fauna and Flora in Florida", Compiled by D.A. Wood, Endangered Species Coordinator.
- USEPA, 1989a. "Risk Assessment Guidance for Superfund: Environmental Evaluation Manual", Volume 2; EPA/540/1-89/002, December, 1989.
- USEPA, 1989b. Ecological Assessment of Hazardous Waste Sites: A Field and Laboratory Reference; United States Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, OH; EPA-600/4-87/028, May 1988.
- USEPA, 1991. "ECO Update: Ecological Assessment of Superfund Sites"; Volume 1: Number 2, Publication 9345.0-051, December, 1991.
- Wolfe, S.H., Reidenauer, J.A., and D.B. Means. An Ecological Characterization of the Florida Panhandle, Fish and Wildlife Service, Washington, D.C., Biological Report 88 (12), October, 1988

ATTACHMENT C



December 22, 1992

Mr. Tom Emenhiser
Client Services Manager
CH2MHILL
One Innovation Drive, Suite C
P.O. Box 370
Alachua, Florida 32615-1670

SUBJECT: NEESA Level C Data Deliverables

Dear Tom:

This letter summarizes our discussion regarding the NEESA Level C deliverables for the NAS Whiting Field data submitted to ABB-ES during the past few months. The feedback from NEESA indicates that the calibration information must be included in the NEESA Level C data packages. The following actions will be taken to address this concern.

1. CH2MHILL will provide the calibration data for all the data packages submitted to ABB-ES.
2. All future data packages will include the raw calibration data.
3. Ms. Karen Daniels will coordinate with the various CH2MHILL laboratories and compile the calibration information for submission to ABB-ES. Ms. Daniels will provide an update to ABB-ES on 12 December 1992.
4. The electronic diskette deliverables have some glitches. The CAS numbers do not match the Form I's and in some cases the electronic copy does not correlate with the hardcopy. ABB-ES will provide a list of the sample delivery groups which may have to be resubmitted.
5. CH2MHILL has clarified the compliance with holding time requirements for TCLP analysis. For all analyses performed at the laboratory, holding times are calculated from the time of sampling. This will be stated in all future case narratives.

The laboratory has been complying with all ABB-ES requests for additional information in a timely manner. I feel that the cooperation exhibited by all participants will assist in validating all future data packages in an efficient and cost effective manner.

ABB Environmental Services, Inc.



If you have any questions, please call me or Eric Blomberg at 904-656-1293.

Very truly yours,

ABB ENVIRONMENTAL SERVICES INC.

Rao V.R. Angara
Rao V.R. Angara
Task Order Manager

cc: Jeralyn Guthrie, CCJM
Eric Blomberg, ABB-ES
Karen Daniels, CH2MHILL
John McVoy, ABB-ES
Kathy Hodak, ABB-ES
File No. 7560-XX (7.2.1)

ATTACHMENT D

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SD-01

Lab Name: CH2M HILL/LRD Contract: V34618

Lab Code: Case No.: V34618 SAS No.: SDG No.: GC-MS

Matrix: (soil/water) SOIL Lab Sample ID: 34618001

Sample wt/vol: 2.0 (g/mL) G Lab File ID: 92M2VO5992

Level: (low/med) LOW Date Received: 12/09/92

% Moisture: not dec. 65 Date Analyzed: 12/18/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

74-87-3-----	Chloromethane	71	U
74-83-9-----	Bromomethane	71	U
75-01-4-----	Vinyl chloride	71	U
75-00-3-----	Chloroethane	71	U
75-09-2-----	Methylene chloride	21	BJ
67-64-1-----	Acetone	210	B
75-15-0-----	Carbon disulfide	9	J
75-35-4-----	1,1-Dichloroethene	71	U
75-34-3-----	1,1-Dichloroethane	71	U
540-59-0-----	1,2-Dichloroethene (total)	380	
67-66-3-----	Chloroform	71	U
107-06-2-----	1,2-Dichloroethane	71	U
78-93-3-----	2-Butanone	41	J
71-55-6-----	1,1,1-Trichloroethane	71	U
56-23-5-----	Carbon tetrachloride	71	U
75-27-4-----	Bromodichloromethane	71	U
78-87-5-----	1,2-Dichloropropane	71	U
10061-01-5-----	cis-1,3-Dichloropropene	71	U
79-01-6-----	Trichloroethene	71	U
124-48-1-----	Dibromochloromethane	71	U
79-00-5-----	1,1,2-Trichloroethane	71	U
71-43-2-----	Benzene	71	U
10061-02-6-----	trans-1,3-Dichloropropene	71	U
75-25-2-----	Bromoform	71	U
591-78-6-----	2-Hexanone	71	U
108-10-1-----	4-Methyl-2-pentanone	71	U
127-18-4-----	Tetrachloroethene	71	U
79-34-5-----	1,1,2,2-Tetrachloroethane	71	U
108-88-3-----	Toluene	23	J
108-90-7-----	Chlorobenzene	71	U
100-41-4-----	Ethylbenzene	71	U
100-42-5-----	Styrene	71	U
1330-20-7-----	Xylenes (total)	11	J

FORM I VOA

3/90

000062

BL

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SD-01

Lab Name: CH2M HILL/LRD Contract: V34618

Lab Code: Case No.: V34618 SAS No.: SDG No.: GC-MS

Matrix: (soil/water) SOIL Lab Sample ID: 34618001

Sample wt/vol: 2.0 (g/mL) G Lab File ID: 92M2VO5992

Level: (low/med) LOW Date Received: 12/09/92

% Moisture: not dec. 65 Date Analyzed: 12/18/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 594-82-1	BUTANE, 2,2,3,3-TETRAMETHYL-	11.20	6300	J
2. 589-43-5	HEXANE, 2,4-DIMETHYL-	12.54	2900	J
3. 584-94-1	HEXANE, 2,3-DIMETHYL-	13.07	4100	J
4. 560-21-4	PENTANE, 2,3,3-TRIMETHYL-	13.22	3300	J
5. 2216-30-0	HEPTANE, 2,5-DIMETHYL-	15.45	5500	J
6. 3073-66-3	CYCLOHEXANE, 1,1,3-TRIMETHYL	15.62	3900	J
7. 7667-60-9	CYCLOHEXANE, 1,2,4-TRIMETHYL	16.02	8300	J
	UNKNOWN	17.50	14000	J
9.	UNKNOWN	18.09	15000	J
10.	UNKNOWN	18.30	13000	J
11.	UNKNOWN	18.75	3900	J
12.	UNKNOWN	18.90	14000	J
13.	UNKNOWN	19.30	17000	J
14.	UNKNOWN	19.47	7600	J
15.	UNKNOWN	19.57	11000	J
16.	UNKNOWN	19.82	6900	J
17. 2847-72-5	DECANE, 4-METHYL-	20.24	11000	J
18.	UNKNOWN	20.65	12000	J
19. 4941-53-1	5-UNDECENE	21.09	3800	J
20. 493-02-7	NAPHTHALENE, DECAHYDRO-, TRA	21.44	9400	J

DB

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLKS1

Lab Name: CH2M HILL/LRD Contract: V34618

Lab Code: Case No.: V34618 SAS No.: SDG No.: GC-MS

Matrix: (soil/water) SOIL Lab Sample ID: METHOD-BLANK

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 92M2VO5982

Level: (low/med) LOW Date Received:

% Moisture: not dec. Date Analyzed: 12/18/92

GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>	Q
74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene chloride	2	BJ
67-64-1-----	Acetone	4	BJ
75-15-0-----	Carbon disulfide	10	U
75-35-4-----	1,1-Dichloroethene	10	U
75-34-3-----	1,1-Dichloroethane	10	U
540-59-0-----	1,2-Dichloroethene (total)	10	U
67-66-3-----	Chloroform	10	U
107-06-2-----	1,2-Dichloroethane	10	U
78-93-3-----	2-Butanone	10	U
71-55-6-----	1,1,1-Trichloroethane	10	U
56-23-5-----	Carbon tetrachloride	10	U
75-27-4-----	Bromodichloromethane	10	U
78-87-5-----	1,2-Dichloropropane	10	U
10061-01-5-----	cis-1,3-Dichloropropene	10	U
79-01-6-----	Trichloroethene	10	U
124-48-1-----	Dibromochloromethane	10	U
79-00-5-----	1,1,2-Trichloroethane	10	U
71-43-2-----	Benzene	10	U
10061-02-6-----	trans-1,3-Dichloropropene	10	U
75-25-2-----	Bromoform	10	U
591-78-6-----	2-Hexanone	10	U
108-10-1-----	4-Methyl-2-pentanone	10	U
127-18-4-----	Tetrachloroethene	10	U
79-34-5-----	1,1,2,2-Tetrachloroethane	10	U
108-88-3-----	Toluene	10	U
108-90-7-----	Chlorobenzene	10	U
100-41-4-----	Ethylbenzene	10	U
100-42-5-----	Styrene	10	U
1330-20-7-----	Xylenes (total)	10	U

FORM I VOA

3/90

000064

BL

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLKS1

Lab Name: CH2M HILL/LRD Contract: V34618
Lab Code: _____ Case No.: V34618 SAS No.: _____ SDG No.: GC-MS
Matrix: (soil/water) SOIL Lab Sample ID: METHOD-BLANK
Sample wt/vol: 5.0 (g/mL) G Lab File ID: 92M2VO5982
Level: (low/med) LOW Date Received: _____
% Moisture: not dec. _____ Date Analyzed: 12/18/92
GC Column: CAP ID: 0.530 (mm) Dilution Factor: 1.0
Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)
Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SD-01

Lab Name: CH2M HILL/LRD Contract: S34618

Lab Code: Case No.: S34618 SAS No.: SDG No.: GC-MS

Matrix: (soil/water) SOIL Lab Sample ID: 34618001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 92M3BN2817

Level: (low/med) LOW Date Received: 12/09/92

% Moisture: 65 decanted: (Y/N) N Date Extracted: 12/15/92

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 12/22/92

Injection Volume: 2.0 (uL) Dilution Factor: 50.0

GPC Cleanup: (Y/N) Y pH: 4.7

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/KG Q

108-95-2-----	Phenol	94000	U
111-44-4-----	bis(2-Chloroethyl) ether	94000	U
95-57-8-----	2-Chlorophenol	94000	U
541-73-1-----	1,3-Dichlorobenzene	94000	U
106-46-7-----	1,4-Dichlorobenzene	94000	U
95-50-1-----	1,2-Dichlorobenzene	94000	U
95-48-7-----	2-Methylphenol	94000	U
108-60-1-----	2,2'-oxybis(1-Chloropropane)	94000	U
106-44-5-----	4-Methylphenol	94000	U
621-64-7-----	N-Nitroso-di-n-propylamine	94000	U
67-72-1-----	Hexachloroethane	94000	U
98-95-3-----	Nitrobenzene	94000	U
78-59-1-----	Isophorone	94000	U
88-75-5-----	2-Nitrophenol	94000	U
105-67-9-----	2,4-Dimethylphenol	94000	U
111-91-1-----	bis(2-Chloroethoxy) methane	94000	U
120-83-2-----	2,4-Dichlorophenol	94000	U
120-82-1-----	1,2,4-Trichlorobenzene	94000	U
91-20-3-----	Naphthalene	94000	U
106-47-8-----	4-Chloroaniline	94000	U
87-68-3-----	Hexachlorobutadiene	94000	U
59-50-7-----	4-Chloro-3-methylphenol	94000	U
91-57-6-----	2-Methylnaphthalene	94000	U
77-47-4-----	Hexachlorocyclopentadiene	94000	U
88-06-2-----	2,4,6-Trichlorophenol	94000	U
95-95-4-----	2,4,5-Trichlorophenol	230000	U
91-58-7-----	2-Chloronaphthalene	94000	U
88-74-4-----	2-Nitroaniline	230000	U
131-11-3-----	Dimethylphthalate	94000	U
208-96-8-----	Acenaphthylene	94000	U
606-20-2-----	2,6-Dinitrotoluene	94000	U
99-09-2-----	3-Nitroaniline	230000	U
83-32-9-----	Acenaphthene	94000	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SD-01

Lab Name: CH2M HILL/LRD

Contract: S34618

Lab Code: Case No.: S34618 SAS No.: SDG No.: GC-MS

Matrix: (soil/water) SOIL Lab Sample ID: 34618001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 92M3BN2817

Level: (low/med) LOW Date Received: 12/09/92

% Moisture: 65 decanted: (Y/N) N Date Extracted: 12/15/92

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 12/22/92

Injection Volume: 2.0 (uL) Dilution Factor: 50.0

GPC Cleanup: (Y/N) Y pH: 4.7

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/KG

Q

CAS NO.

COMPOUND

51-28-5-----	2,4-Dinitrophenol	230000	U
100-02-7-----	4-Nitrophenol	230000	U
132-64-9-----	Dibenzofuran	94000	U
121-14-2-----	2,4-Dinitrotoluene	94000	U
84-66-2-----	Diethylphthalate	21000	BJ
7005-72-3-----	4-Chlorophenyl-phenylether	94000	U
86-73-7-----	Fluorene	94000	U
100-01-6-----	4-Nitroaniline	230000	U
534-52-1-----	4,6-Dinitro-2-methylphenol	230000	U
86-30-6-----	N-Nitrosodiphenylamine (1)	94000	U
101-55-3-----	4-Bromophenyl-phenylether	94000	U
118-74-1-----	Hexachlorobenzene	94000	U
87-86-5-----	Pentachlorophenol	230000	U
85-01-8-----	Phenanthrene	94000	U
120-12-7-----	Anthracene	94000	U
86-74-8-----	Carbazole	94000	U
84-74-2-----	Di-n-butylphthalate	94000	U
206-44-0-----	Fluoranthene	94000	U
129-00-0-----	Pyrene	94000	U
85-68-7-----	Butylbenzylphthalate	94000	U
91-94-1-----	3,3'-Dichlorobenzidine	94000	U
56-55-3-----	Benzo(a)anthracene	94000	U
218-01-9-----	Chrysene	94000	U
117-81-7-----	bis(2-Ethylhexyl)phthalate	21000	J
117-84-0-----	Di-n-octylphthalate	94000	U
205-99-2-----	Benzo(b)fluoranthene	94000	U
207-08-9-----	Benzo(k)fluoranthene	94000	U
50-32-8-----	Benzo(a)pyrene	94000	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	94000	U
53-70-3-----	Dibenz(a,h)anthracene	94000	U
191-24-2-----	Benzo(g,h,i)perylene	94000	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SD-01

Lab Name: CH2M HILL/LRD Contract: S34618

Lab Code: Case No.: S34618 SAS No.: SDG No.: GC-MS

Matrix: (soil/water) SOIL Lab Sample ID: 34618001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 92M3BN2817

Level: (low/med) LOW Date Received: 12/09/92

% Moisture: 65 decanted: (Y/N) N Date Extracted: 12/15/92

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 12/22/92

Injection Volume: 2.0 (uL) Dilution Factor: 50.0

GPC Cleanup: (Y/N) Y pH: 4.7

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

Number TICs found: 20

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 62108-25-2	DECANE, 2,6,7-TRIMETHYL-	15.89	320000	J
2. 696-29-7	CYCLOHEXANE, (1-METHYLETHYL)	16.45	200000	J
26730-14-3	TRIDECANE, 7-METHYL-	17.00	610000	J
4.	UNKNOWN	17.82	260000	J
5.	UNKNOWN	18.39	300000	J
6.	UNKNOWN	18.75	180000	J
7.	UNKNOWN	19.22	170000	J
8.	UNKNOWN	19.34	270000	J
9.	UNKNOWN	19.44	210000	J
10. 54832-83-6	1H-INDENE, OCTAHYDRO-2,2,4,4	20.00	170000	J
11.	UNKNOWN	20.17	230000	J
12. 18344-37-1	HEPTADECANE, 2,6,10,14-TETRA	20.32	970000	J
13.	UNKNOWN	20.64	190000	J
14.	UNKNOWN	21.07	150000	J
15.	UNKNOWN	21.67	160000	J
16.	UNKNOWN	21.79	180000	J
17.	UNKNOWN	21.97	200000	J
18.	UNKNOWN	22.59	190000	J
19.	UNKNOWN	23.24	310000	J
20. 1921-70-6	PENTADECANE, 2,6,10,14-TETRA	24.07	360000	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLKS1

Lab Name: CH2M HILL/LRD Contract: S34618
 Lab Code: _____ Case No.: S34618 SAS No.: _____ SDG No.: GC-MS
 Matrix: (soil/water) SOIL Lab Sample ID: METHOD-BLANK
 Sample wt/vol: 30.0 (g/mL) G Lab File ID: 92M3BN2814
 Level: (low/med) LOW Date Received: _____
 % Moisture: _____ decanted: (Y/N) N Date Extracted: 12/15/92
 Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 12/22/92
 Injection Volume: 2.0 (uL) Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: _____

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NO. COMPOUND Q

108-95-2	Phenol	330	U
111-44-4	bis(2-Chloroethyl) ether	330	U
95-57-8	2-Chlorophenol	330	U
541-73-1	1,3-Dichlorobenzene	330	U
106-46-7	1,4-Dichlorobenzene	330	U
95-50-1	1,2-Dichlorobenzene	330	U
95-48-7	2-Methylphenol	330	U
108-60-1	2,2'-oxybis(1-Chloropropane)	330	U
106-44-5	4-Methylphenol	330	U
621-64-7	N-Nitroso-di-n-propylamine	330	U
67-72-1	Hexachloroethane	330	U
98-95-3	Nitrobenzene	330	U
78-59-1	Isophorone	330	U
88-75-5	2-Nitrophenol	330	U
105-67-9	2,4-Dimethylphenol	330	U
111-91-1	bis(2-Chloroethoxy) methane	330	U
120-83-2	2,4-Dichlorophenol	330	U
120-82-1	1,2,4-Trichlorobenzene	330	U
91-20-3	Naphthalene	330	U
106-47-8	4-Chloroaniline	330	U
87-68-3	Hexachlorobutadiene	330	U
59-50-7	4-Chloro-3-methylphenol	330	U
91-57-6	2-Methylnaphthalene	330	U
77-47-4	Hexachlorocyclopentadiene	330	U
88-06-2	2,4,6-Trichlorophenol	330	U
95-95-4	2,4,5-Trichlorophenol	800	U
91-58-7	2-Chloronaphthalene	330	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	330	U
208-96-8	Acenaphthylene	330	U
606-20-2	2,6-Dinitrotoluene	330	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	330	U

FORM I SV-1

3/90

000076

B6

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLKS1

Lab Name: CH2M HILL/LRD Contract: S34618

Lab Code: _____ Case No.: S34618 SAS No.: _____ SDG No.: GC-MS

Matrix: (soil/water) SOIL Lab Sample ID: METHOD-BLANK

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 92M3BN2814

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N) N Date Extracted: 12/15/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 12/22/92

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: _____

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

Q

CAS NO.

COMPOUND

51-28-5-----	2,4-Dinitrophenol	800	U
100-02-7-----	4-Nitrophenol	800	U
132-64-9-----	Dibenzofuran	330	U
121-14-2-----	2,4-Dinitrotoluene	330	U
84-66-2-----	Diethylphthalate	85	BJ
7005-72-3-----	4-Chlorophenyl-phenylether	330	U
86-73-7-----	Fluorene	330	U
100-01-6-----	4-Nitroaniline	800	U
534-52-1-----	4,6-Dinitro-2-methylphenol	800	U
86-30-6-----	N-Nitrosodiphenylamine (1)	330	U
101-55-3-----	4-Bromophenyl-phenylether	330	U
118-74-1-----	Hexachlorobenzene	330	U
87-86-5-----	Pentachlorophenol	800	U
85-01-8-----	Phenanthrene	330	U
120-12-7-----	Anthracene	330	U
86-74-8-----	Carbazole	330	U
84-74-2-----	Di-n-butylphthalate	330	U
206-44-0-----	Fluoranthene	330	U
129-00-0-----	Pyrene	330	U
85-68-7-----	Butylbenzylphthalate	330	U
91-94-1-----	3,3'-Dichlorobenzidine	330	U
56-55-3-----	Benzo(a)anthracene	330	U
218-01-9-----	Chrysene	330	U
117-81-7-----	bis(2-Ethylhexyl)phthalate	330	U
117-84-0-----	Di-n-octylphthalate	330	U
205-99-2-----	Benzo(b)fluoranthene	330	U
207-08-9-----	Benzo(k)fluoranthene	330	U
50-32-8-----	Benzo(a)pyrene	330	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	330	U
53-70-3-----	Dibenz(a,h)anthracene	330	U
191-24-2-----	Benzo(g,h,i)perylene	330	U

(1) - Cannot be separated from Diphenylamine

FORM I SV-2

3/90

000077

B6

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SBLKS1

Lab Name: CH2M HILL/LRD Contract: S34618

Lab Code: _____ Case No.: S34618 SAS No.: _____ SDG No.: GC-MS

Matrix: (soil/water) SOIL Lab Sample ID: METHOD-BLANK

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 92M3BN2814

Level: (low/med) LOW Date Received: _____

% Moisture: _____ decanted: (Y/N) N Date Extracted: 12/15/92

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 12/22/92

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: _____

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

Number TICs found: 12

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 544-25-2	1,3,5-CYCLOHEPTATRIENE	5.12	240	BJ
2.	UNKNOWN	6.58	1500	J
3.	UNKNOWN	6.68	1000	J
4. 123-42-2	2-PENTANONE, 4-HYDROXY-4-MET	7.57	47000	BJ
5.	UNKNOWN	8.35	130	J
6.	UNKNOWN	9.30	1700	J
7.	UNKNOWN	10.10	190	J
8. 111-90-0	ETHANOL, 2-(2-ETHOXYETHOXY)-	11.42	220	BJ
9. 628-68-2	ETHANOL, 2,2'-OXYBIS-, DIACE	11.52	130	BJ
10.	UNKNOWN	12.17	880	J
11. 72439-78-2	TETRASILOXANE, 3,5-DIETHOXY-	17.87	230	BJ
12.	UNKNOWN	25.16	190	J

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SD-01

Lab Name: CH2M HILL/LRD

Contract: ABB_ENG

Lab Code: CH2M

Case No.: 34618

SAS No.:

SDG No.:

Matrix: (soil/water) SOIL

Lab Sample ID: 34618001

Sample wt/vol: 30.0 (g/mL) G

Lab File ID:

% Moisture: 65 decanted: (Y/N) N

Date Received: 12/09/92

Extraction: (SepF/Cont/Sonc) SONC

Date Extracted: 12/11/92

Concentrated Extract Volume: 5000 (uL)

Date Analyzed: 12/22/92

Injection Volume: 1.00 (uL)

Dilution Factor: 2.00

GPC Cleanup: (Y/N) Y pH: 4.7

Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NO.

COMPOUND

Q

319-84-6-----	alpha-BHC	9.7	U
319-85-7-----	beta-BHC	5.0	J
319-86-8-----	delta-BHC	9.7	U
58-89-9-----	gamma-BHC (Lindane)	9.7	U
76-44-8-----	Heptachlor	9.7	U
309-00-2-----	Aldrin	9.7	U
1024-57-3-----	Heptachlor epoxide	9.7	U
959-98-8-----	Endosulfan I	9.7	U
60-57-1-----	Dieldrin	180	P
72-55-9-----	4,4'-DDE	110	P
72-20-8-----	Endrin	19	U
33213-65-9-----	Endosulfan II	19	U
72-54-8-----	4,4'-DDD	28	
1031-07-8-----	Endosulfan sulfate	19	U
50-29-3-----	4,4'-DDT	19	U
72-43-5-----	Methoxychlor	97	U
53494-70-5-----	Endrin ketone	19	U
7421-36-3-----	Endrin aldehyde	19	U
5103-71-9-----	alpha-Chlordane	21	P
5103-74-2-----	gamma-Chlordane	18	P
8001-35-2-----	Toxaphene	970	U
12674-11-2-----	Aroclor-1016	190	U
11104-28-2-----	Aroclor-1221	380	U
11141-16-5-----	Aroclor-1232	190	U
53469-21-9-----	Aroclor-1242	190	U
12672-29-6-----	Aroclor-1248	190	U
11097-69-1-----	Aroclor-1254	190	U
11096-82-5-----	Aroclor-1260	190	U

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PBLKS12-11

Lab Name: CH2M HILL/LRD

Contract: ABB_ENG

Lab Code: CH2M

Case No.: 34618

SAS No.:

SDG No.:

Matrix: (soil/water) SOIL

Lab Sample ID: PBLKS12-11

Sample wt/vol: 30.0 (g/mL) G

Lab File ID:

% Moisture: decanted: (Y/N)

Date Received:

Extraction: (SepF/Cont/Sonc) SONC

Date Extracted: 12/11/92

Concentrated Extract Volume: 5000 (uL)

Date Analyzed: 12/20/92

Injection Volume: 1.00 (uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) Y

pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

319-84-6-----alpha-BHC	1.7	U
319-85-7-----beta-BHC	1.7	U
319-86-8-----delta-BHC	1.7	U
58-89-9-----gamma-BHC (Lindane)	1.7	U
76-44-8-----Heptachlor	1.7	U
309-00-2-----Aldrin	1.7	U
1024-57-3-----Heptachlor epoxide	1.7	U
959-98-8-----Endosulfan I	1.7	U
60-57-1-----Dieldrin	3.3	U
72-55-9-----4,4'-DDE	3.3	U
72-20-8-----Endrin	3.3	U
33213-65-9-----Endosulfan II	3.3	U
72-54-8-----4,4'-DDD	3.3	U
1031-07-8-----Endosulfan sulfate	3.3	U
50-29-3-----4,4'-DDT	1.7	J
72-43-5-----Methoxychlor	17	U
53494-70-5-----Endrin ketone	3.3	U
7421-36-3-----Endrin aldehyde	3.3	U
5103-71-9-----alpha-Chlordane	1.7	U
5103-74-2-----gamma-Chlordane	1.7	U
8001-35-2-----Toxaphene	170	U
12674-11-2-----Aroclor-1016	33	U
11104-28-2-----Aroclor-1221	67	U
11141-16-5-----Aroclor-1232	33	U
53469-21-9-----Aroclor-1242	33	U
12672-29-6-----Aroclor-1248	33	U
11097-69-1-----Aroclor-1254	33	U
11096-82-5-----Aroclor-1260	33	U

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PBLKS12_11

Lab Name: CH2M HILL/LRD

Contract: EL_TORO

Lab Code: CH2M

Case No.: 34615

SAS No.:

SDG No.:

Matrix: (soil/water) SOIL

Lab Sample ID: PBLKS12_11

Sample wt/vol: 30.0 (g/mL) G

Lab File ID:

% Moisture: decanted: (Y/N)

Date Received:

Extraction: (SepF/Cont/Sonc) SONC

Date Extracted: 12/11/92

Concentrated Extract Volume: 5000 (uL)

Date Analyzed: 12/22/92

Injection Volume: 1.00 (uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) Y pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

319-84-6-----alpha-BHC	1.7	U
319-85-7-----beta-BHC	1.7	U
319-86-8-----delta-BHC	1.7	U
58-89-9-----gamma-BHC (Lindane)	1.7	U
76-44-8-----Heptachlor	1.7	U
309-00-2-----Aldrin	1.7	U
1024-57-3-----Heptachlor epoxide	1.7	U
959-98-8-----Endosulfan I	1.7	U
60-57-1-----Dieldrin	3.3	U
72-55-9-----4,4'-DDE	3.3	U
72-20-8-----Endrin	3.3	U
33213-65-9-----Endosulfan II	3.3	U
72-54-8-----4,4'-DDD	3.3	U
1031-07-8-----Endosulfan sulfate	3.3	U
50-29-3-----4,4'-DDT	3.3	U
72-43-5-----Methoxychlor	17	U
53494-70-5-----Endrin ketone	3.3	U
7421-36-3-----Endrin aldehyde	3.3	U
5103-71-9-----alpha-Chlordane	1.7	U
5103-74-2-----gamma-Chlordane	1.7	U
8001-35-2-----Toxaphene	170	U
12674-11-2-----Aroclor-1016	33	U
11104-28-2-----Aroclor-1221	67	U
11141-16-5-----Aroclor-1232	33	U
53469-21-9-----Aroclor-1242	33	U
12672-29-6-----Aroclor-1248	33	U
11097-69-1-----Aroclor-1254	33	U
11096-82-5-----Aroclor-1260	33	U